

Computer Graphics Theoretical

***Focus on the words that are colored Red.**

1. **Computer graphics** is concerned with all aspects of producing pictures or images using a computer
2. We can generate images by computer that are **indistinguishable** from photographs of real objects
3. **Design** is one of the four major areas of computer graphics.
4. Four major areas of computer graphics : **Design , Display of information , simulation and animation , user interfaces**
5. The field of **scientific visualization** provides graphical tools that help researchers to interpret the vast quantity of data that they generate
6. Design problems are either **overdetermined**, such that they possess no solution that satisfies all the criteria, or **underdetermined**, such that they have multiple solutions that satisfy the design criteria
7. The **pointing device** allows the user to indicate a position on screen and almost always incorporates one or more buttons to allow the user to send signals or interrupts to computers
8. The pixels are stored in a part of memory called the **frame buffer**
9. The **depth**, or **precision**, of the frame buffer, defined as the number of bits that are used for each pixel

10. Our interaction with computers has become dominated by a **visual paradigm** that includes windows, icons, menus, and a pointing device, such as a mouse is called **User Interfaces**
11. **The visible spectrum**, which has wavelengths in the range of 350 to 780 nanometers (nm), is called (**visible**) light
12. In **full-color systems**, there are **24 (or more) bits** per pixel. Such systems can display sufficient colors to represent most images realistically
13. Two basic entities must be part of any image formation Process: **Object and Viewer**
14. **Resolution** determines the details that you can see in the image
15. **The primitive functions** define the low-level objects or atomic entities that our system can display
16. An API must provide a set of **input functions** to allow us to deal with the diverse forms of input that characterize modern graphics systems
17. The **control functions** enable us to communicate with the window system, to initialize our programs, and to deal with any errors that take place during the execution of our programs
18. A good API provides this information through a set of **query functions**
19. **Attribute functions** allow us to perform operations ranging from choosing the color with which we display a line segment, to picking a pattern with which to fill the inside of a polygon, to selecting a typeface for the titles on a graph

20. **Polygons** play a special role in computer graphics because we can display them rapidly and use them to approximate arbitrary surfaces
21. The usual strategy is to start with a list of vertices and generate a set of triangles consistent with the polygon defined by the list, a process known as **triangulation**
22. In **Stroke text** We use vertices to specify line segments or curves that outline each character
23. There are two forms of text: stroke and raster where **Stroke text** is constructed as are other geometric objects
24. We can separate primitives into two classes: geometric **primitives and image, or raster, primitives**
25. **Geometric primitives** are specified in the problem domain and include points, line segments, polygons, curves, and surfaces.
26. Finite sections of lines between two vertices, called **line segments**.
27. Characters are defined as rectangles of bits called **bit blocks**
28. Digital devices display a **straight line segment** by plotting discrete points between the two endpoints
29. **Stair-step effect** produced when a line is generated as a series of pixel positions
30. An ellipse is defined as the set of points such that the sum of the distances from two **fitted positions (foci)** is the same for all points